

# Guideline to: Coastal Flooding Hazards Mitigation Bylaw 1439

## District of North Saanich



## Introduction

In BC, local governments, including the District of North Saanich (DNS) are responsible for land use management, including the management of land use in relation to natural hazards, which includes flooding. Most local governments in the province already have bylaws that require buildings to be constructed to avoid or to minimize flood damage, either from rivers or from coastal flooding.

In view of this responsibility, the DNS is proposing North Saanich Coastal Mitigation Flooding Bylaw No. 1439 (2018) that considers Sea Level Rise (SLR) and related coastal storms. The DNS is also, separate from Bylaw 1439, proposing changes to the existing Official Community Plan (OCP) through North Saanich Official Community Plan Marine Policy Bylaw No. 1442 (2018) and related updated Development Permit Guidelines that will support increased flexibility to allow individual properties to implement adaptation measures to respond to sea level rise as it occurs.

The responsibility of local governments to manage flooding hazards is laid out in the Local Government Act, and guidance is provided in the January 1, 2018 amendment to the related "Flood Hazard Area Land Use Management Guidelines (FHALUMG).

## Why Do This Now?

Although SLR rates and amounts vary around the globe, sea levels have been rising on average over the last century at approximately 1.7 mm/yr.

It is anticipated that Sea Level Rise will continue for several centuries, but the ultimate extent of future SLR will depend on how well global Greenhouse Gas (GHG) emissions are managed, which is still uncertain.

Provincial Flood Hazard Guidelines presently suggest planning for at least 0.5 m of SLR by Year 2050, and 1.0 m SLR by Year 2100. Recent science suggests that actual SLR may be higher than these guidelines. Action by local governments based on current provincial guidance is advised. (However, ongoing monitoring of research and SLR predictions may affect recommended Provincial Guidelines in the decades ahead.)



### **BC Coastal Flood Hazard Area Land Use Management Amendment (2018)**

A key element of the amended guidelines is to require minimum floor elevations for new building construction so they remain above SLR related flood levels. They also define building setbacks so buildings are resistant to the effects of wind-blown waves, wave tossed debris and shoreline erosion during coastal storms.

# Provincial Guidance

The Province of British Columbia, as of January 1, 2018, has required local governments and approving officers to consider updated ‘Flood Hazard Area Land Use Management Guidelines’<sup>1</sup> (FHALUMG). In those guidelines, “Requirements for buildings, subdivision, and zoning should allow for sea level rise (SLR) to the Year 2100. Land use adaptation strategies as set out in Official Community Plans (OCPs) and Regional Growth Strategies (RGSs) should allow for sea level rise up to the year 2200 and beyond.”

The District would be remiss if it does not address these requirements in a reasonable timeline.

In considering this Provincial Requirement, the District has reviewed its Official Community Plan and Zoning Bylaws. These bylaws generally permit low-density residential development on the waterfront parcels that are subject to coastal flooding. The flood hazard is not considered serious enough that the District should discontinue this type of development on these parcels. However, the hazard is sufficiently significant that new buildings and major alterations to existing buildings should be constructed above expected flood levels.

For residential buildings constructed in the next few years, their end of life is potentially 75-80 years ahead – or approximately Year 2100 when at least one meter of SLR is expected. Smaller additions or accessory buildings like garages may have a shorter lifespan – perhaps to about Year 2050 when a 0.5 m SLR is expected. The bylaw provisions are designed to protect these new buildings from anticipated rare but severe storms at these future sea levels.

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<sup>1</sup> Province of British Columbia, Flood Hazard Area Land Use Management Guidelines, May 2004, Amendment Sections 3.5 and 3.6, October 2017

**There is no requirement** to change existing buildings or existing site works.



# What Is the Bylaw Trying to Achieve?



## Protect Life

Habitable areas of homes need to be above flood and wave/debris levels to provide a safe haven during the high tide hours of a storm. Design of buildings also should ensure that life support systems – communication systems, fire protection, key emergency access and egress routes – are also resilient against coastal flooding and the “Flood Construction Level” (FCL) provides a defined elevation for their design.



## Protect Property

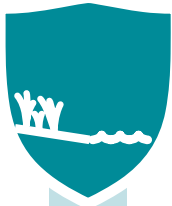
The proposed bylaw defines the elevation of what can be built in the future to maintain the benefits of waterfront property.

Property ownership is subject to change, and it is important that current and future owners are protected. Fortunately, the great majority of waterfront lots in the District are relatively large and well above expected sea levels. New buildings can easily be constructed to higher elevations if necessary. In DNS shoreline areas that are exceptionally low-lying, designation as Special Development Areas will support detailed planning to protect both property and the environment in the future.



## Sustain the Environment

The proposed bylaw setback allowances help to avoid coastal impacts. Shoreline beaches, mudflats and marshes need to be allowed (or assisted) to adjust upland as the seas rise.



## Protect Shoreline Character

In future developments, the existing Development Permit Guideline in the District of North Saanich OCP encourages retention of a natural and green character in a 15m setback from the natural boundary. The intent of these existing guidelines will not change with Sea Level Rise. The existing 15 m setback will slowly move inland as the Natural Boundary (NB) slowly moves inland towards the Future Estimated Natural Boundary (FENB).

If SLR adaptation measures are proposed at the shoreline within the 15 m DP1 setback to protect property from flooding or from erosion due to rising sea levels, proposed changes to the existing OCP will provide greater flexibility to implement those measures than exists today. In many cases, SLR adaptation solutions will likely be more effective in Special Development Areas or when undertaken jointly by several neighbours. Such larger scale adaptations will need to be designed to be environmentally acceptable and approved by senior government agencies and are likely to involve public/private co-operation for implementation.

The proposed Coastal Flooding Hazard Mitigation bylaw which defines Flood Construction Levels and building setbacks does not affect any of these potential adaptation measures.



# Definition of Water Levels, Boundaries and Setbacks

The key terms and concepts related to coastal flooding are illustrated in Figure 1 and 2 for existing and future scenarios.

Figure 1: Today

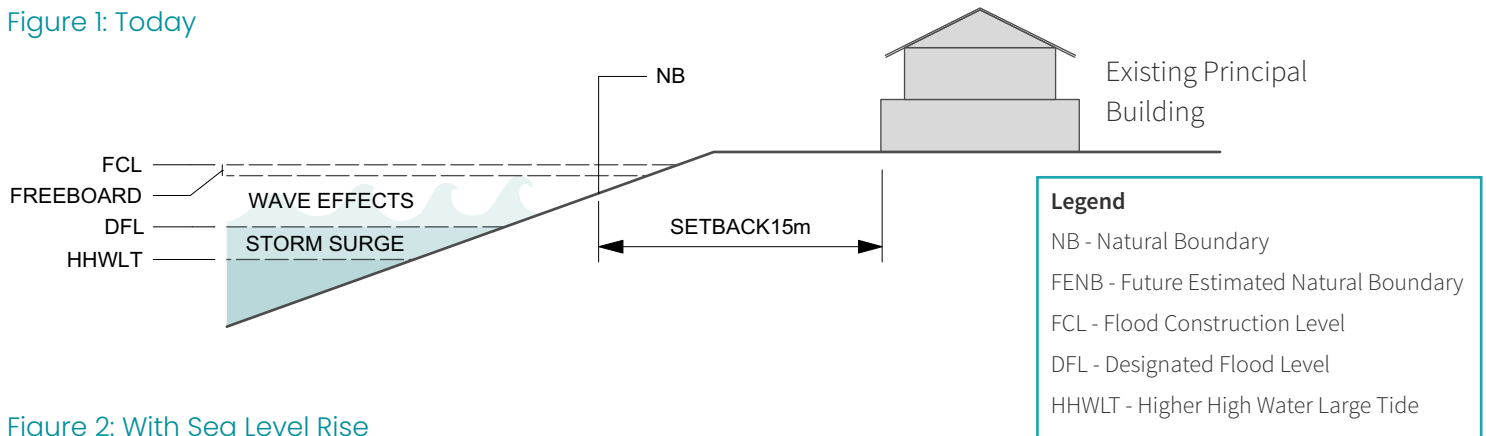
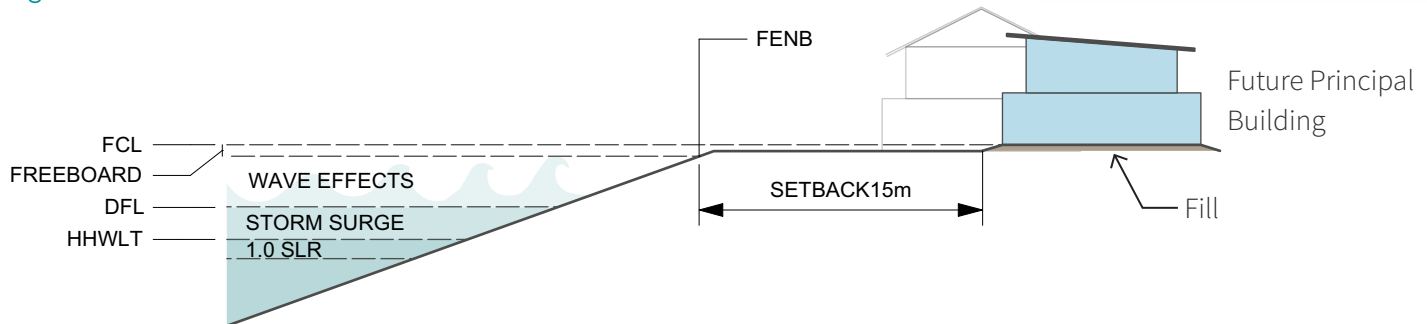


Figure 2: With Sea Level Rise



**Higher High Water Large Tide (HHWLT)** is an existing high water level that often occurs during 'winter spring tides'. These tides happen several times a month, and are associated with the occurrence of a full moon or a new moon, approximately every two weeks.

**Storm Surge** occurs during a coastal storm as the result of the strong winds and low air pressure, which can bring the water above HHWLT or any other simultaneously occurring tide level.

**The Designated Flood Level (DFL)** is the anticipated still water level that considers both HHWLT and Storm Surge.

**Flood Construction Level (FCL)** is the required minimum elevation for the base of a floor structure for habitable floors or for the storage of valuable goods. FCL includes the Designated Flood Level, plus Wave Effects, and a Freeboard allowance.

**Freeboard** is a vertical distance between the anticipated Wave Effects and the Flood Construction Level. It allows for unknowns including a more rapid SLR than anticipated, specific details of an individual land parcel and particulars of the waters immediately offshore of a property.

**Wave Effects** considers the actions and effects of waves along the shoreline that causes water to rise above the DFL. These

effects vary considerably depending on the shoreline exposure, its character and the presence of coastal structures including seawalls or steep shorelines. These effects drive the spray and debris that may affect a building located close to the shoreline.

**Natural Boundary (NB)** defines the seaward boundary of a property where the prolonged presence of water creates a change in vegetation and the character of the land itself (see Land Title Act). The foreshore and water seaward of the Natural Boundary are Crown property.

**The Future Estimated Natural Boundary (FENB)** is the predicted location of the future Natural Boundary as the result of sea level rise. Setbacks for future new buildings should move inland with the Future Estimated Natural Boundary to preserve the protection that exists at the shoreline. Provincial guidelines suggest that calculation of the Future Estimated Natural Boundary can be based on the Flood Construction Level minus the Freeboard allowance.

**Setback** is the required minimum horizontal distance between the Natural Boundary (or Future Estimated Natural Boundary) and any FCL-related structural fill that would be vulnerable to erosion if sited too close to the sea.

# Adapting at the Time of Building Reconstruction

All single-family homes in BC eventually come to end of their useful life. Adaptation to sea level rise is most easily addressed as a part of the normal rebuilding process.

The proposed District of North Saanich Coastal Flooding Hazards Mitigation Bylaw only applies for additions to existing buildings, which exceed 25% of the existing residential floor area, and to new buildings.

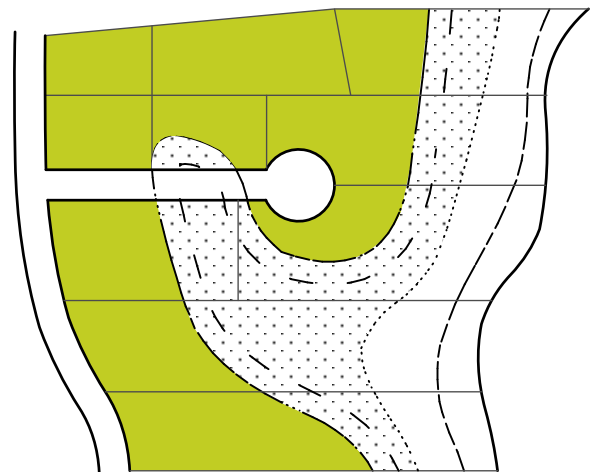
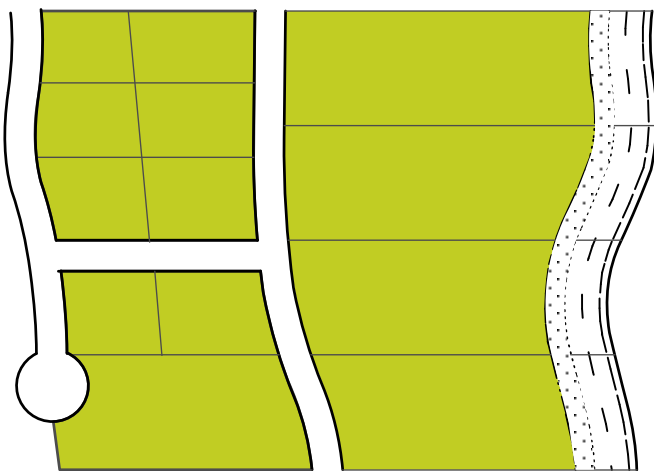
For existing or future building(s) outside of the Coastal Floodplain, the Coastal Flooding Hazards Mitigation Bylaw does not apply.

## High Bluff Sites

In high bluff sites – which are most of DNS – the Bylaw affects only a narrow strip that extends a few metres inland from existing setbacks. Many existing buildings are not affected.

## Low Sites

A few lower sites will have large SLR flooding risks, which can also include inland properties. DNS is proposing Special Development Areas where neighbourhood scale options can be assessed for concentrated areas of low properties.



## Plan Examples of How Existing Lots are Affected



Accessory Building or Additions  
<25% of Principal Building Area



New Principal Building Area

— Existing Natural Boundary

— Lot Line

--- FENB 0.5m SLR

— FENB 1.0m SLR

..... 15m Setback from FENB 0.5m SLR

—... 15m Setback from FENB 1.0m SLR

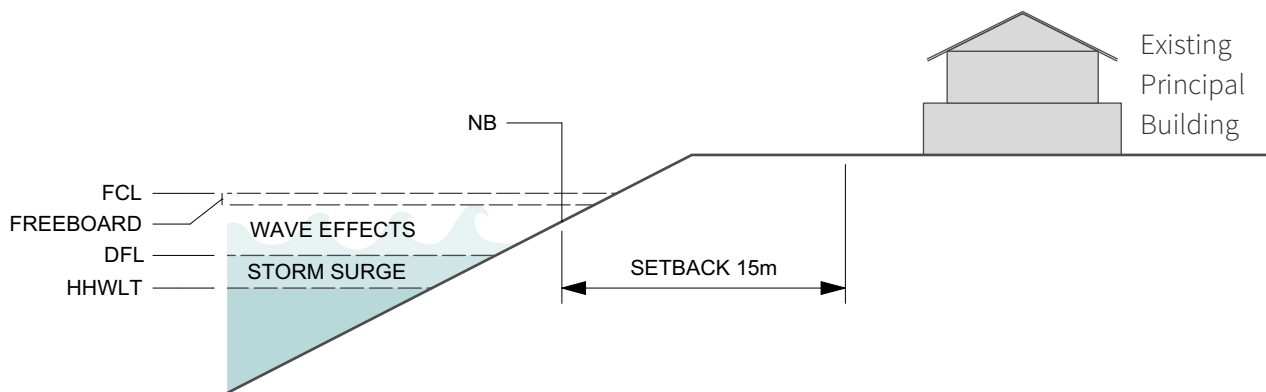
Detailed Maps 1-12 attached to the coastal Flooding Hazards Mitigation Bylaw show the extent of the coastal floodplain (and Flood Construction Levels).

## Example A1: High Bluff Sites with Adequate Setback

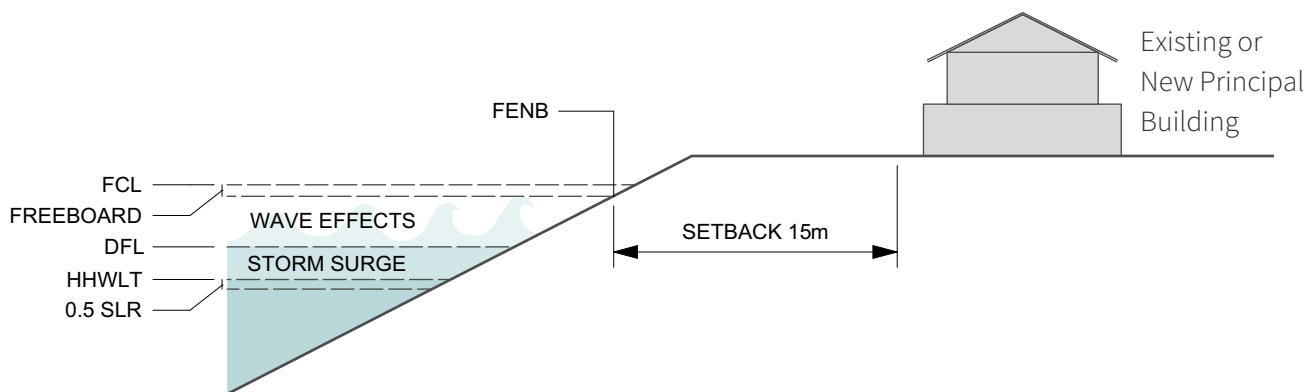
The great majority of District of North Saanich shorelines can be characterized as high bluff land parcels. In these areas the impacts of Sea Level Rise on existing homes are modest, as is shown in Figures 3 and 4. In these areas, most existing homes are above the SLR 1.0 Flood Construction Levels.

Figure 3: FCLs and Setbacks for Buildings Outside the Coastal Floodplain

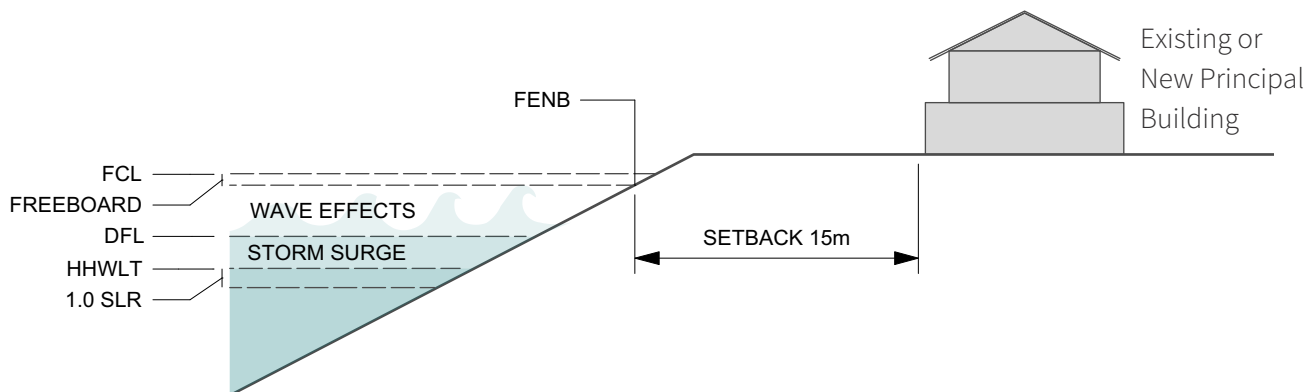
- a) **Existing conditions:** the existing buildings are high enough and set back far enough that they are outside the Coastal Floodplain and the bylaw has no effect.



- b) **0.5m SLR** will move the Natural Boundary inland towards the Future Estimated Natural Boundary. In this situation the existing residence is still outside the setback and can be reconstructed or expanded at its existing location and elevation. New accessory buildings may be constructed outside the setback based on 0.5m SLR.



- c) **One meter of SLR** will move the Natural Boundary further inland to the Future Estimated Natural Boundary. In this case the existing buildings are still outside the setback and can be reconstructed or expanded in their existing location and elevation.

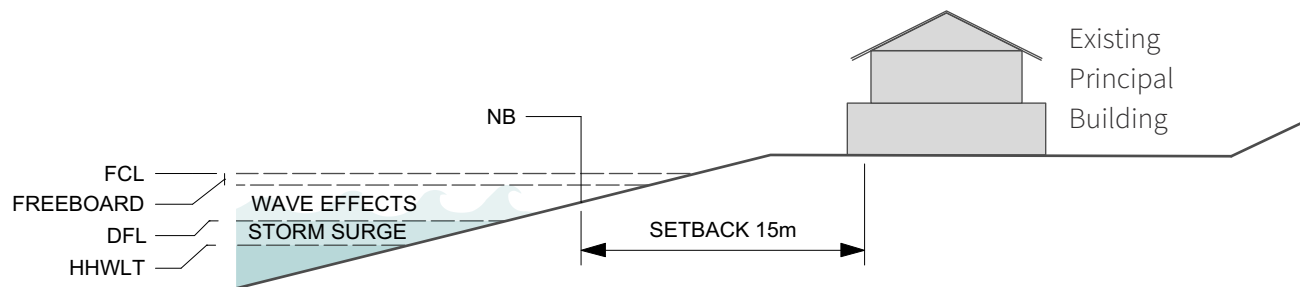


## Example A2: Moderate Site with Limited Setback

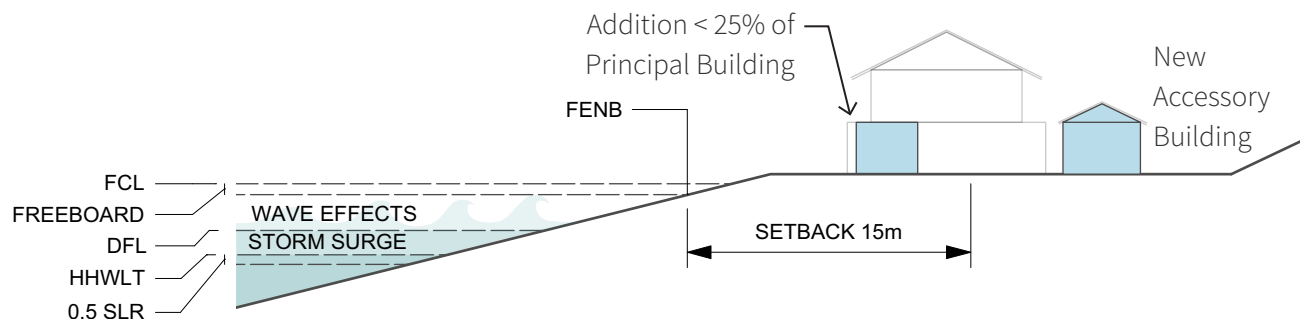
In some locations the existing terrain on the lot may restrict the feasibility of a 15 m setback because the property rises sharply behind the existing building.

Figure 4: FCLs and Setbacks for Buildings Partially Inside the setback areas

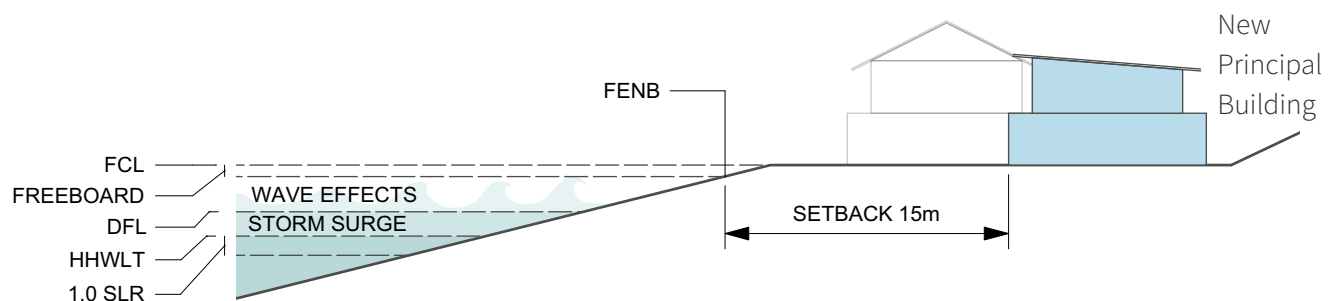
**a) Existing conditions:** the existing buildings are above future FCL, but the setback is restricted.



**b) 0.5 m sea level rise** will move the Natural Boundary inland towards the Future Estimated Natural Boundary. In this case the existing building does not meet the setback but can remain in place. Minor building additions (less than 25% of existing floor area) can be constructed at the same elevation or setback as the existing principal building. New accessory buildings may be constructed outside the setback and at FCL based on 0.5 m SLR.



**c) One meter of SLR** will move the Natural Boundary further inland to the Future Estimated Natural Boundary. In this case, existing buildings will not meet the setback but can remain in place. New buildings or complete reconstructions must be constructed beyond the 1.0 m SLR setback line. Floor elevation requirements would be the corresponding FCL.

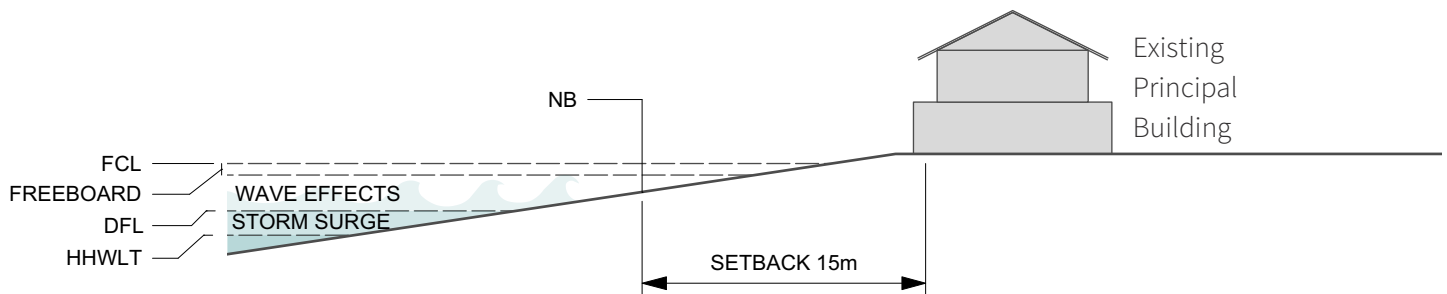


## Example B1: Low Sites with Limited Setback

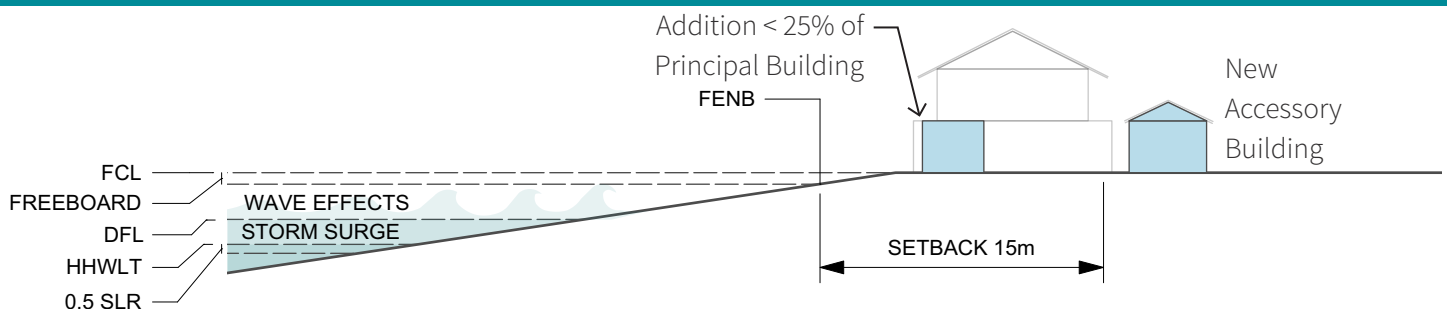
For a limited number of homes on low lying land in District of North Saanich, the hazards and impacts of Sea Level Rise could be severe if not mitigated. Figures 5 and 6 illustrate conditions where the natural shoreline is low, and where existing buildings are close to the beach or foreshore. Conditions similar to Figure 5 / 6 are generally limited to the two proposed 'Special Development Areas', or a few other localized shores in the District.

Figure 5: FCLs and Setbacks for Buildings on Low Sites and Partially inside the Setback Lines

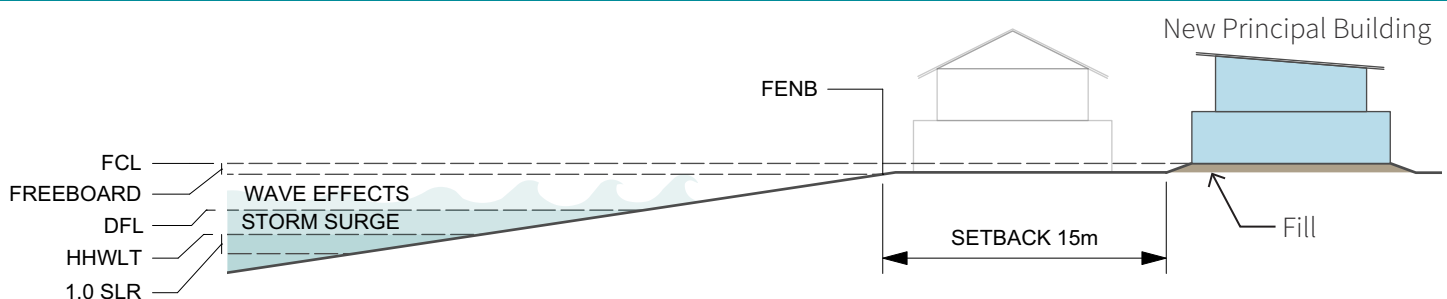
**a) Existing conditions:** the existing buildings have minimal setback and they may be exposed to flooding hazards today.



**b) 0.5m sea level rise** will move the Natural Boundary inland towards the Future Estimated Natural Boundary, which moves inland more than occurs on a steeply sloping land parcel. In this case, existing buildings do not meet the new setback but can remain in place. Minor building additions (less than 25% of existing floor area) can be constructed anywhere behind the front of the existing building. New accessory buildings may be constructed outside the setback and at FCL based on 0.5 m SLR.



**c) One meter of sea level rise** will move the Natural Boundary even further inland towards the Future Estimated Natural Boundary. In this case the existing buildings do not meet the setback but can remain in place. At the end of the life of existing buildings, any reconstruction or new buildings must be constructed beyond the revised setback line, and at the appropriate FCL. The floor could be on a mound or a raised foundations.





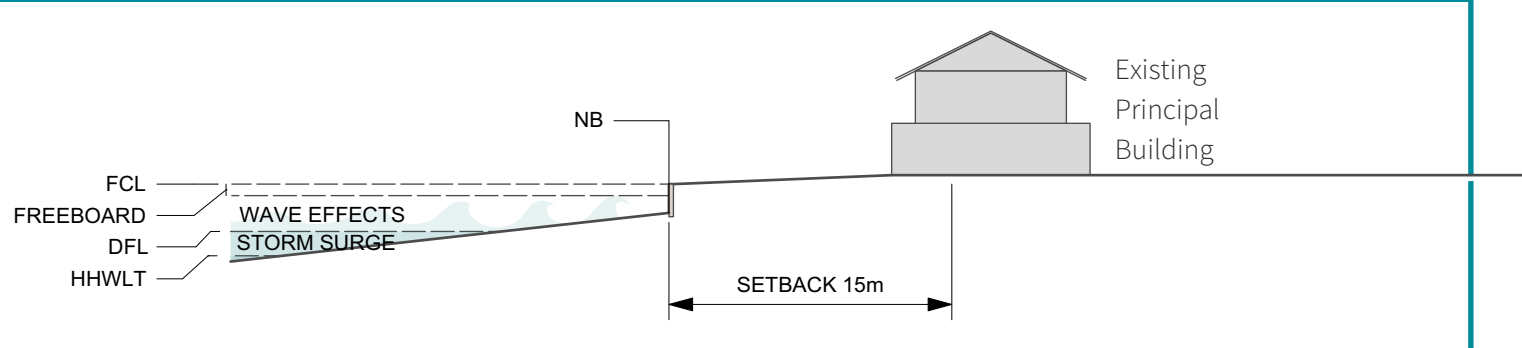
## Example B2: Very Low Sites with Limited Setbacks

Figure 6 illustrates a situation that exists at a small number of sites within the DNS. In many of these situations a seawall may already exist near the existing natural boundary. The proposed bylaw does not apply to the seawall.

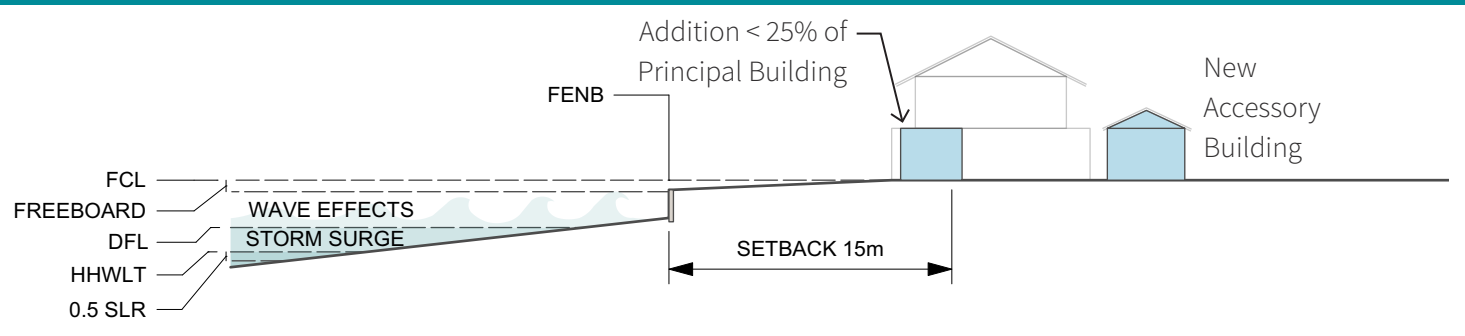
Many of these sites are located within the proposed 'Special Development Areas' where a future neighbourhood process will likely assist in the neighbourhood-scale planning and development of adaptation plans and zoning bylaws. Senior government approvals will likely be needed to protect these concentrations of low-lying properties.

Figure 6: FCLs and Setbacks for very Low Sites with Buildings Partially inside the Setback Lines

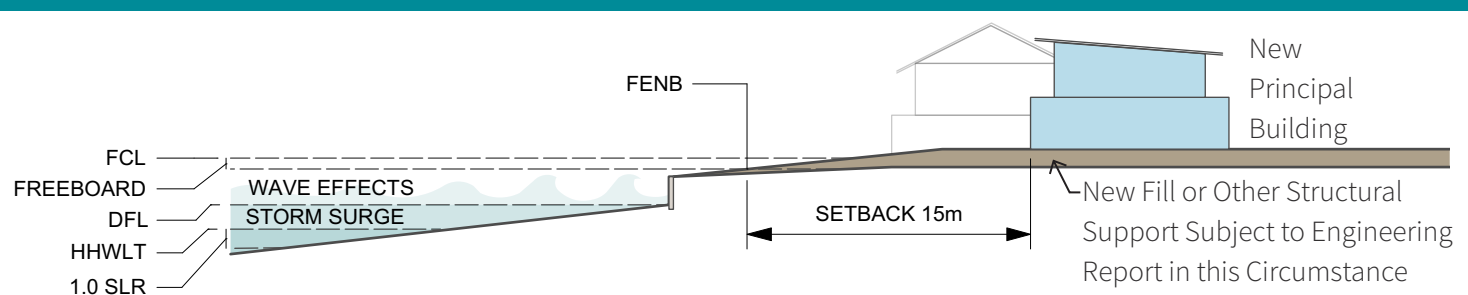
**a) Existing conditions:** The existing setback from the existing Natural Boundary may not be met in some cases.



**b) 0.5m sea level rise** will move the Natural Boundary towards the Future Estimated Natural Boundary. Existing buildings will not meet the setback but can remain in place. Minor building additions (less than 25% of existing floor area) can be constructed as long as they are not closer to the sea or lower in elevation than the habitable areas of the existing principal residence. New accessory buildings may be constructed outside the setback and at FCL based on 0.5 m SLR.



**c) One meter of SLR** will move the Natural Boundary further inland towards a Future Estimated Natural Boundary which may or may not be on-site. In some situations an existing lot may be completely submerged during a future coastal storm. Existing buildings do not meet setback or FCL requirements but can remain. In these situations there are likely to be many options, including raising buildings with structural support or fill or being part of a neighbourhood scale adaptation plan. Use of proposed OCP Development Permits and a Bylaw 1439 siting exemption will apply with site-specific setback and foundation or fill provisions informed by an engineering report.



# What's in the Updated Bylaws?

(refer to Bylaw 1439 and OCP Amendment 1442 for details)

The primary intent of the bylaws is:

Bylaw 1439 A Bylaw to Mitigate Coastal Flood Hazards: implements flood construction levels and setbacks for new buildings or major additions that reduce risk from sea level rise and coastal flooding. This bylaw does not apply to shoreline edge treatments or to environmental issues on the first 15 m setback from the existing natural boundary.

Bylaw 1442 OCP Amendment Bylaw: adjusts policies and development permit guidelines to increase flexibility for landowners to adapt to rising sea levels and protect property through a development permit.

## Coastal Flooding Hazards Mitigation Bylaw No. 1439

### KEY REQUIREMENTS

- In the coastal floodplain defined by District bylaw (see Maps 1 through 12), the Local Government Act requires that the underside of any floor system or the top of any pad supporting any habitable floor area to be above the flood level specified in the bylaw, and that any landfill required to support a floor system or pad not extend within any applicable setback specified in the bylaw.
- New Principal Buildings follow Map 12 (1.0 SLR) requirements for setback and Flood Construction Level.

### KEY EXEMPTIONS

- Requirements are triggered by building permit for buildings or additions, do not apply to existing buildings, and do not require replacement or alteration of existing buildings or site works;
- Allows a habitable addition up to 25% of total floor area of existing principal building at same or greater floor elevation as existing habitable floors, with no portion of additional building area closer to the natural boundary of the sea than any portion of existing principal building;
- New Buildings other than Principal Buildings (e.g. Accessory Buildings like shed, garage) would follow Map 11 (0.5 SLR) standards for Flood Construction Level and setback.
- New Principal Buildings (as defined in the Zoning Bylaw) would follow Map 12 (1.0 SLR) standards for Flood Construction Level and setback.

## OCP AMENDMENT BYLAW 1442 REFINEMENTS

- Adding high level policies in view of the likelihood of coastal flooding. These policies and associated Development Permit Guidelines will provide landowners with greater flexibility in setbacks and protecting their properties.
- Identifies 'Special Development Areas' at Tsehum Harbour and Lochside McTavish Interchange coastal areas. Existing land uses at these areas should continue to be allowed. The District may develop a Long-Term Flood Protection Strategy for these areas, which may consider neighbourhood scale adaptation.

### FLEXIBILITY THROUGH OCP AMENDMENTS

- Amending existing Development Permit Guidelines will:
  - Allow coastal works in existing setback areas that *'are intended and designed to preserve the shoreline character and limit coastal flood-related effects'* and related minor amendments.
  - Allow adjustment to required setbacks 'where it can be demonstrated to the District's satisfaction that a lesser distance is acceptable' – allowing some discretion for engineering innovation on a site-specific basis.

### Integration with Existing Development Permit and Building Permit Processes

Existing regulations require approvals for new homes or other buildings, additions or regrading within 15 m of the existing natural boundary of the sea.

The updated regulations incorporate provisions to adapt to sea level rise into similar development permit and building permit processes.

Similar to today's recommended practice, applicants are encouraged to contact the planning and building department early, to gain assistance in meeting all regulations, including those related to SLR.

# Meeting Key Coastal Flooding Hazard Bylaw Requirements

The steps below are written from the point of view of an applicant for a Development Permit or a Building Permit for an improvement to a single-family site or building. Steps might be different for a commercial or multi-family development.



## Step 1: Identify the Flood Construction Levels that apply to your project and site:

- a) If an addition <25% of existing residential floor area, you may build at same elevation and setback of residential areas of your existing principal building
- b) If a non-principal accessory building, find your site and Flood Construction Level on Map 11 (based on 0.5 m Sea Level Rise)
- c) If an addition >25% of existing residential floor area, or a new principal building, find your site and Flood Construction Level on Map 12 (based on 1.0 m Sea Level Rise)

## Step 2: Map the applicable Flood Construction Level and setback on your site topographic plan

- a) Using a site topographic survey (already required for building permit or development permit purposes), locate the contour for the applicable Flood Construction Level.
- b) The required setback is from Future Estimated Natural Boundary (FENB). To determine this, subtract **0.6 m** (the freeboard) from the Flood Construction Level and use the resulting elevation as the FENB contour line. From the FENB, the location of the minimum setback is 15 m parallel inland.
- c) The proposed new building (or major addition >25% of existing residential floor area) needs to have all habitable floors (top of slab or base of wood structure) above the Flood Construction Level, and beyond the minimum setback line. Structural fill if used also should be behind setbacks, unless varied by engineering report and development permit.

## Step 3: Sketch your proposed site and building development:

- a) Although it is not a bylaw requirement, you are encouraged to review the draft site and building sketches with District planning and building staff.
- b) As well as SLR adaptation, staff may bring your attention to other regulations (e.g. zoning, building code, other development permits) that you may not have been up to date on.
- c) After this early review, a formal drafting and application process would proceed in most cases.

## Step 4: If your site is so low that proposed Flood Construction Levels and setbacks cannot be met, you may be in a Special Development Area where a neighbourhood scale solution is being considered:

- a) Contact District planning and building staff to check if you are in a Special Development Area.
- b) Consider taking part in stakeholder engagement processes related to a Special Development Area Long Term Flood Protection Strategies.
- c) If you must proceed to rebuild prior to the conclusion of a Special Development Area plan, or you have a low site outside a Special Development Area plan, work with District Staff on how your grading and construction could integrate into a longer-term neighbourhood Sea Level Rise adaptation. The updated Development Permit guidelines provide some flexibility to find a practical solution and still meet the Coastal Flooding Hazard Bylaw provisions.

The above process is for a single-family application. In cases of subdivision or rezoning, or higher level uses (e.g. multi-family residential, commercial, mixed use, industrial, institutional) contact the District Planning and Building staff early.

# Relationship to Other DNS Bylaws

The DNS Zoning Bylaw currently requires a setback on waterfront properties, stating “no building or structure other than staircases, walkways, and retaining walls may be within 15 metres (49.2 ft.) of the natural boundary of the marine shoreline, except in the Marine (M) Zones”.

The Coastal Flooding Hazard Mitigation Bylaw No. 1439 uses a similar 15 m setback, but adds minimum flood construction levels and acknowledges that the setback will move inland from an existing natural boundary (NB) to a future estimated natural boundary (FENB) as sea level rise (SLR) continues. Bylaw No. 1439 also requires that structural fill or foundation to support a new building be outside the setback so that it is not subject to undue wave action or erosion.

The Official Community Plan Marine Policy Bylaw No. 1442 provides policy and Development Permit amendments to allow flexibility in marine setbacks and shoreline treatments, if supported by a qualified professional report, to adjust to Sea Level Rise and flood risk. The OCP amendments do not restrict the type of shoreline treatment to be considered.

Other existing policies in the Official Community Plan provide guidance on character of shoreline areas and protection of the natural environment. These provisions are separate from, and not altered by Bylaw 1439 or 1442.

## For More Information

### District of North Saanich Website links

- <https://www.northsaanich.ca/MarinePolicy>

### Background Reports from Other Sources

- <https://www.northsaanich.ca/node/110>

### Province of British Columbia Flood Hazard Land Use Management

- <https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/drought-flooding-dikes-dams/integrated-flood-hazard-management/flood-hazard-land-use-management>

### Legislated Flood Assessments in a Changing Climate in BC

- <https://www.egbc.ca/getmedia/f5c2d7e9-26ad-4cb3-b528-940b3aaa9069/Legislated-Flood-Assessments-in-BC.pdf.aspx>

### BC Adapts Video Series

Includes a BC Climate Change Backgrounder, plus six video shorts on Coastal Flood Management

- <https://www2.gov.bc.ca/gov/content/environment/climate-change/adaptation/bc-adapts>

### Contact Us

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